

FIG. 1

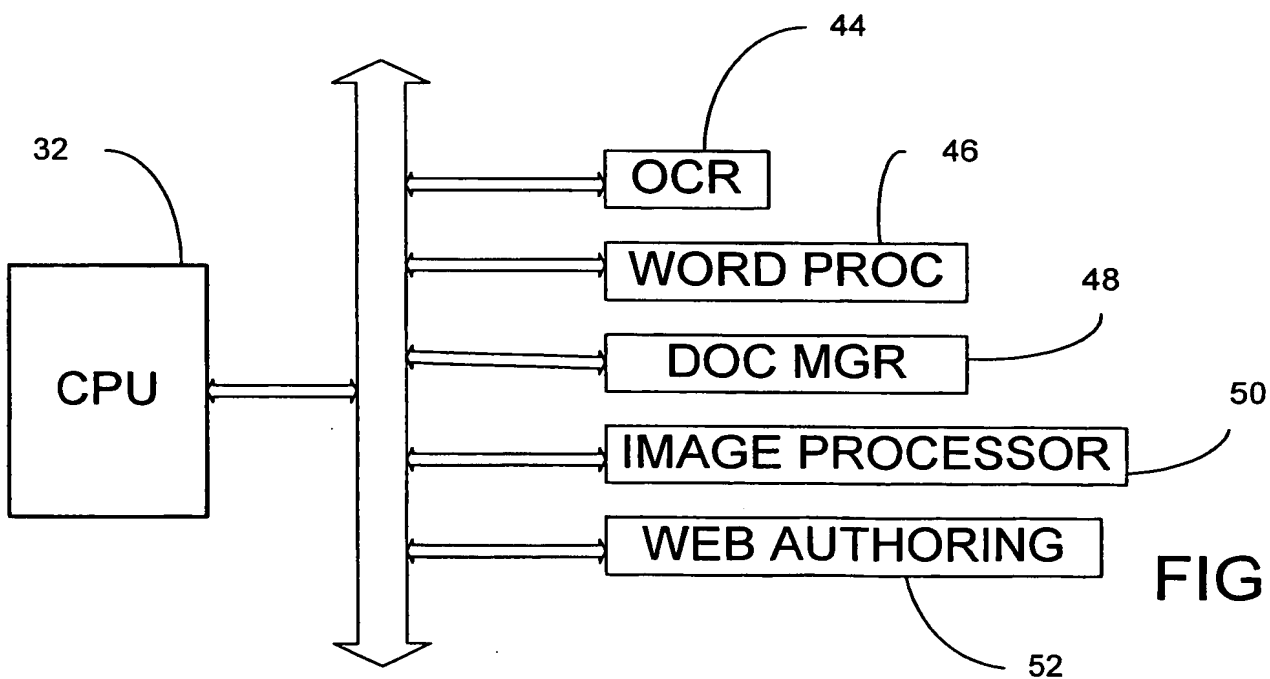


FIG. 2

FIG. 3

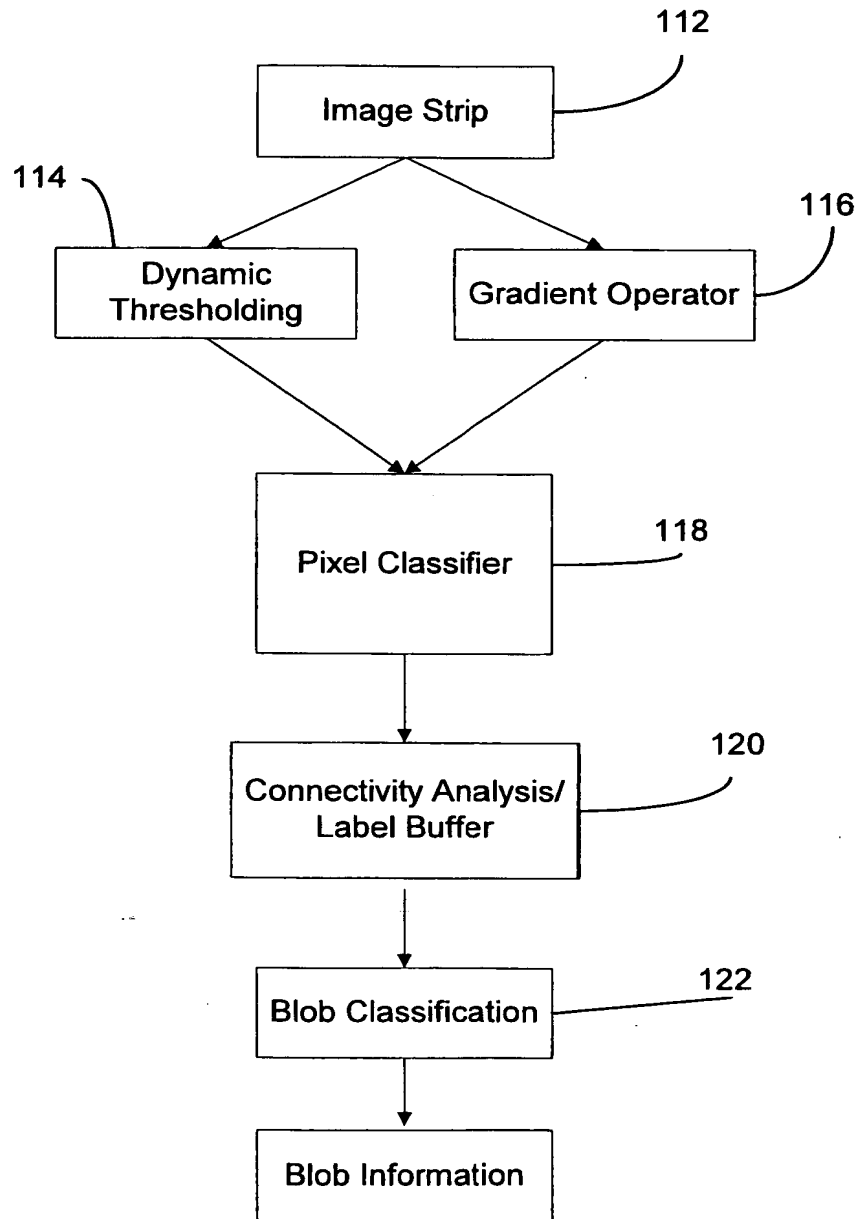


FIG. 4

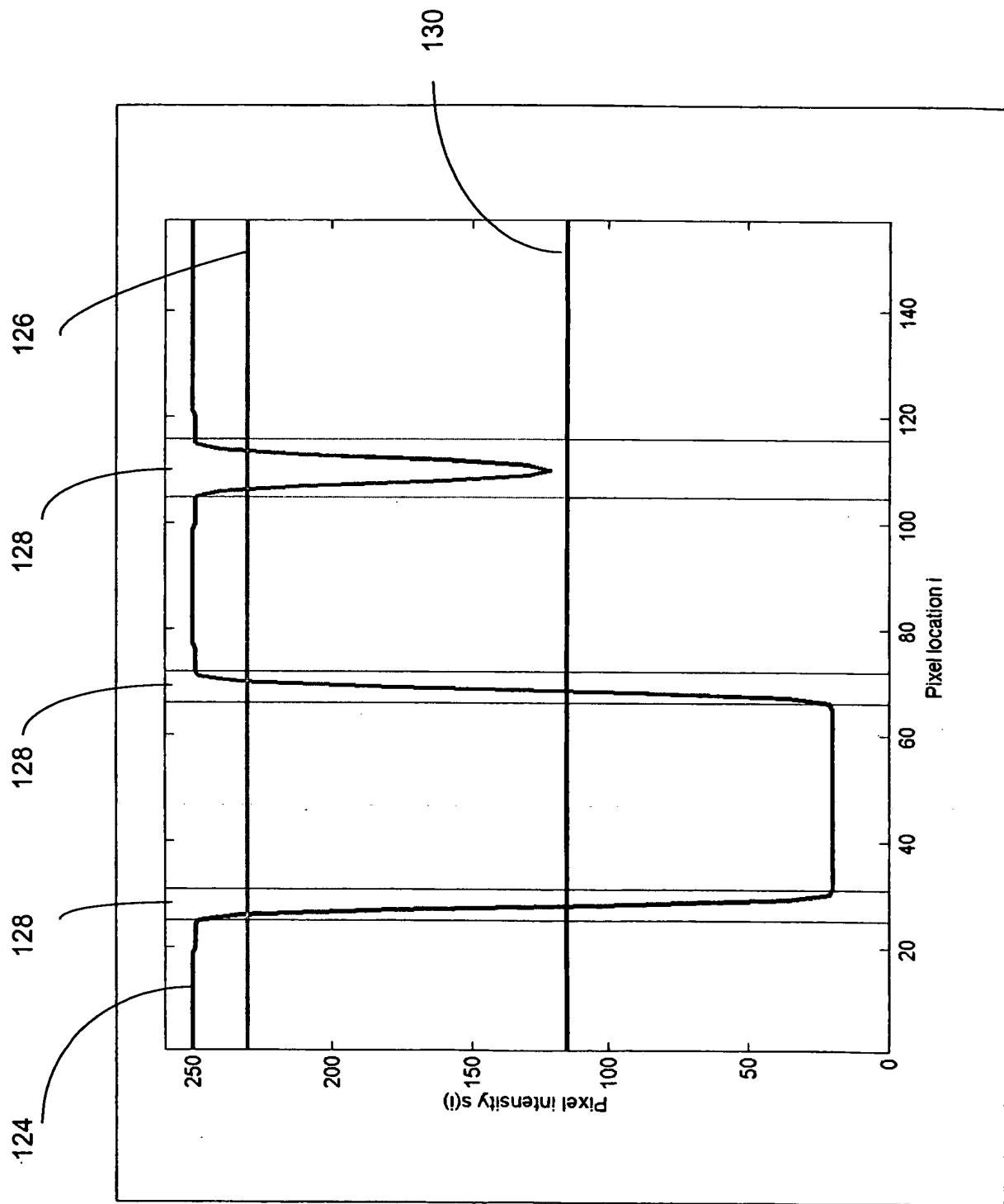


FIG. 5

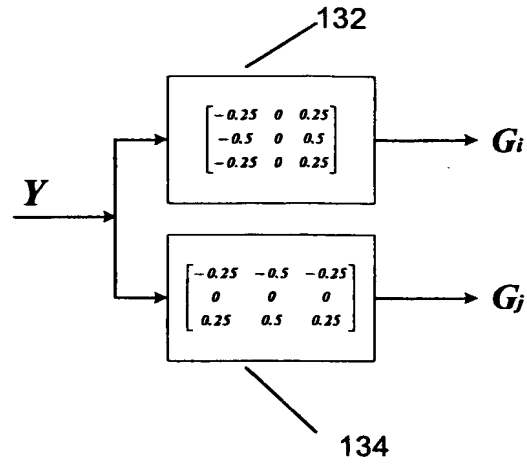


FIG. 6

$$C(Y, \|\nabla Y\|, Chroma) = \begin{cases} \text{WHITE,} & chroma < T_c \text{ AND } \|\nabla Y\| < T_c \text{ AND } Y \geq T_w \\ \text{WHITE EDGE,} & chroma < T_c \text{ AND } \|\nabla Y\| \geq T_c \text{ AND } Y \geq T_w \\ \text{GRAY,} & chroma < T_c \text{ AND } \|\nabla Y\| < T_c \text{ AND } T_g \leq Y < T_w \\ \text{GRAY EDGE,} & chroma < T_c \text{ AND } \|\nabla Y\| \geq T_c \text{ AND } T_g \leq Y < T_w \\ \text{BLACK,} & (chroma < T_c \text{ AND } Y < T_g) \text{ OR } Y \leq 30 \\ \text{COLOR,} & chroma \geq T_c \text{ AND } \|\nabla Y\| < T_c \\ \text{COLOR EDGE,} & chroma \geq T_c \text{ AND } \|\nabla Y\| \geq T_c \end{cases}$$

(Equation 2.)

FIG. 7

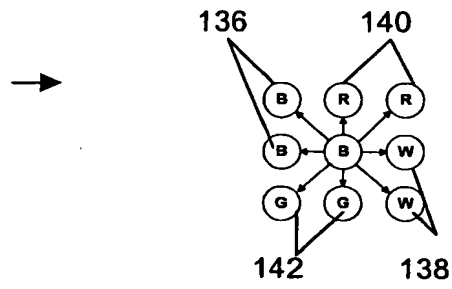


FIG. 8

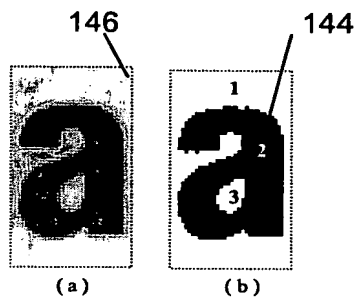


FIG. 9

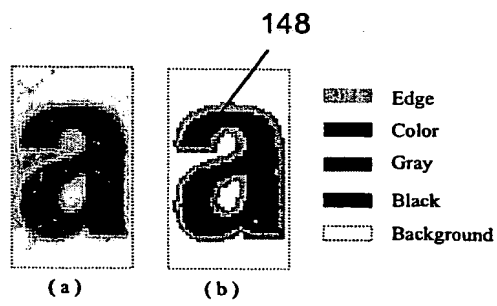
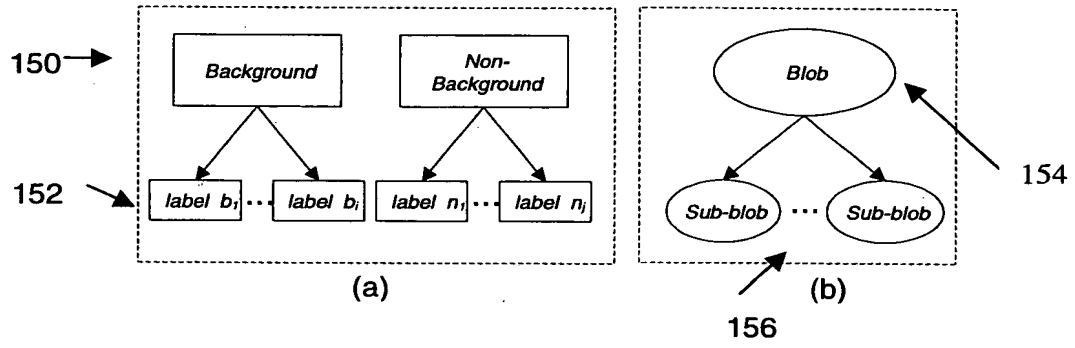


FIG. 10



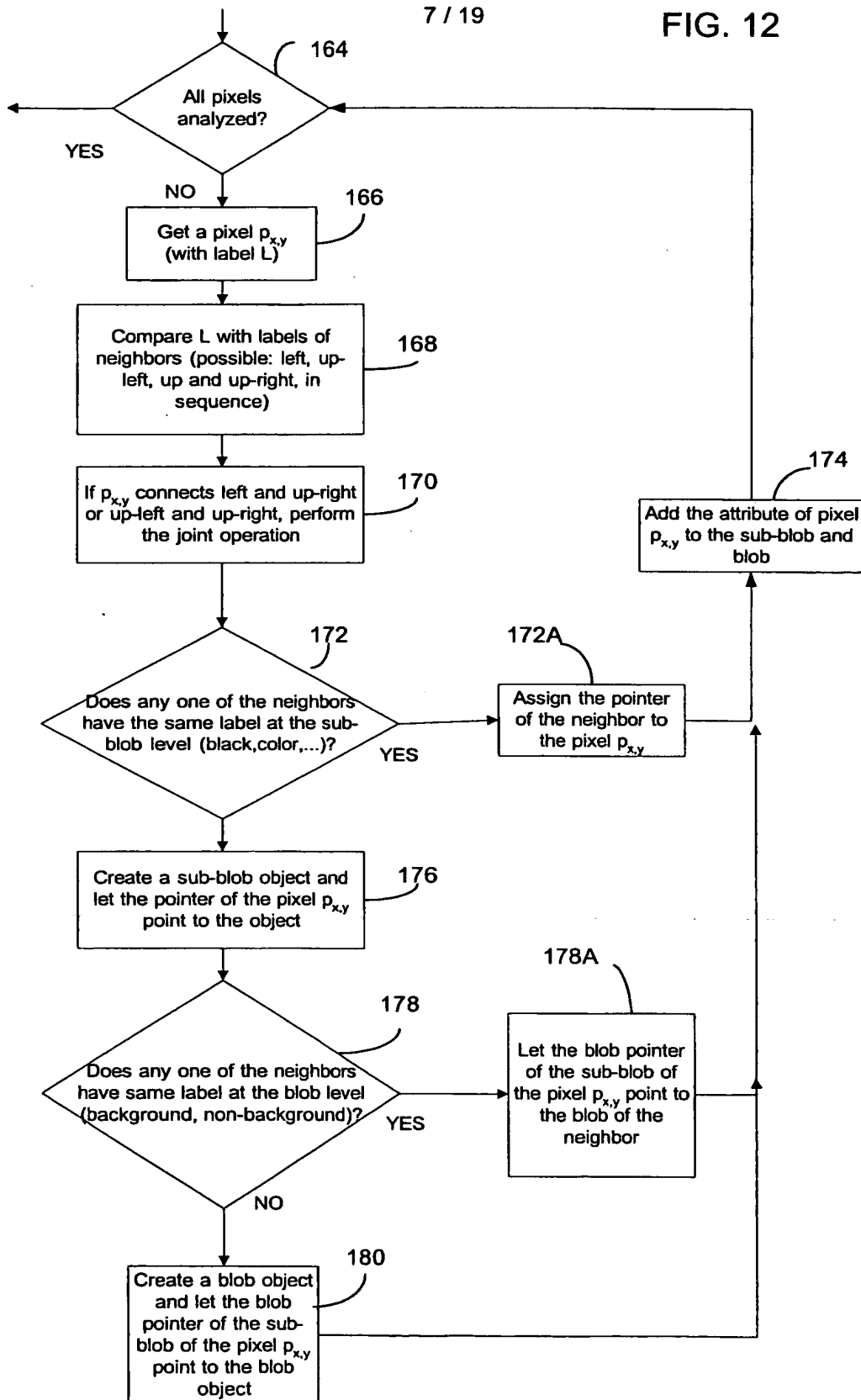


FIG. 12A

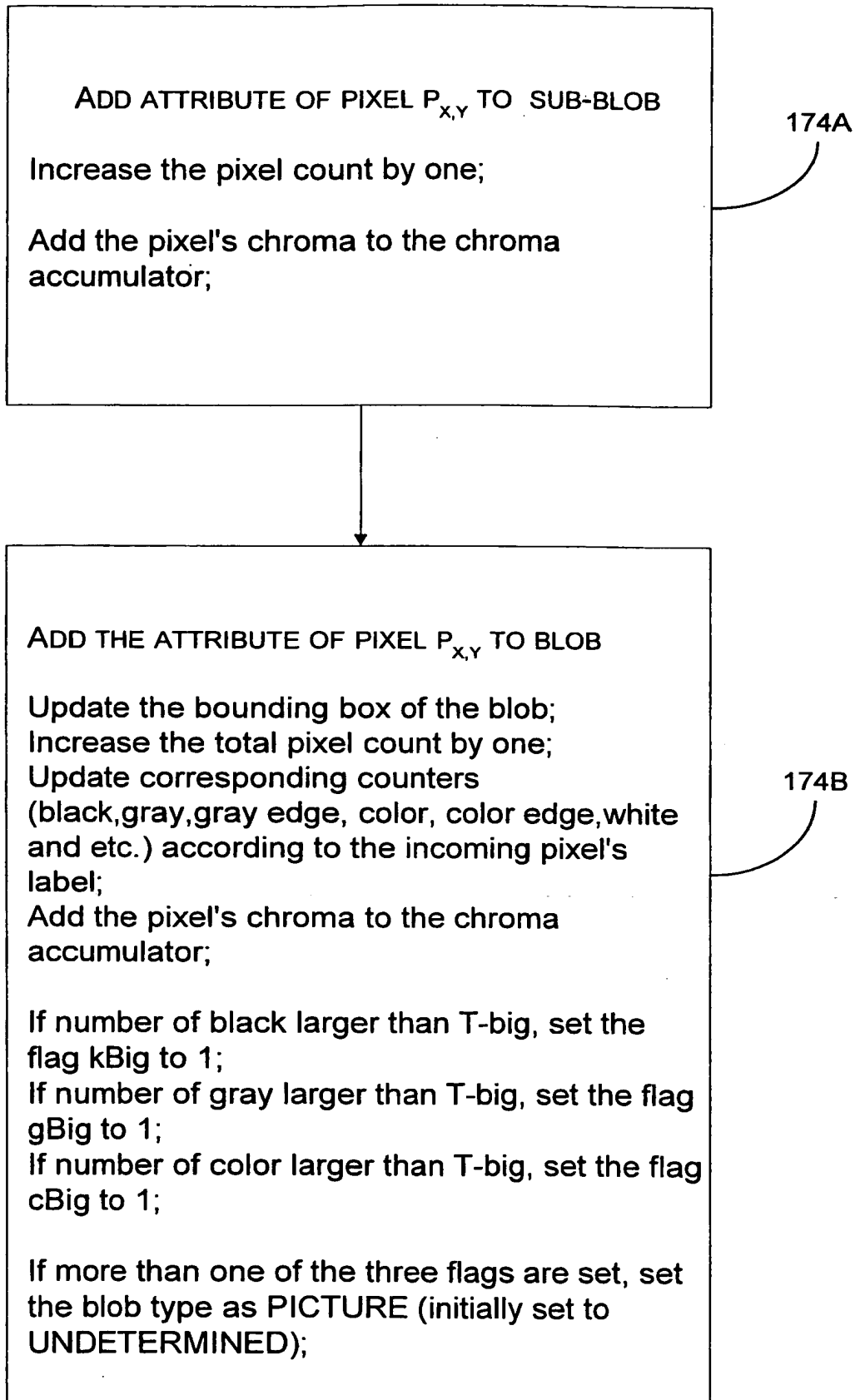


FIG. 13

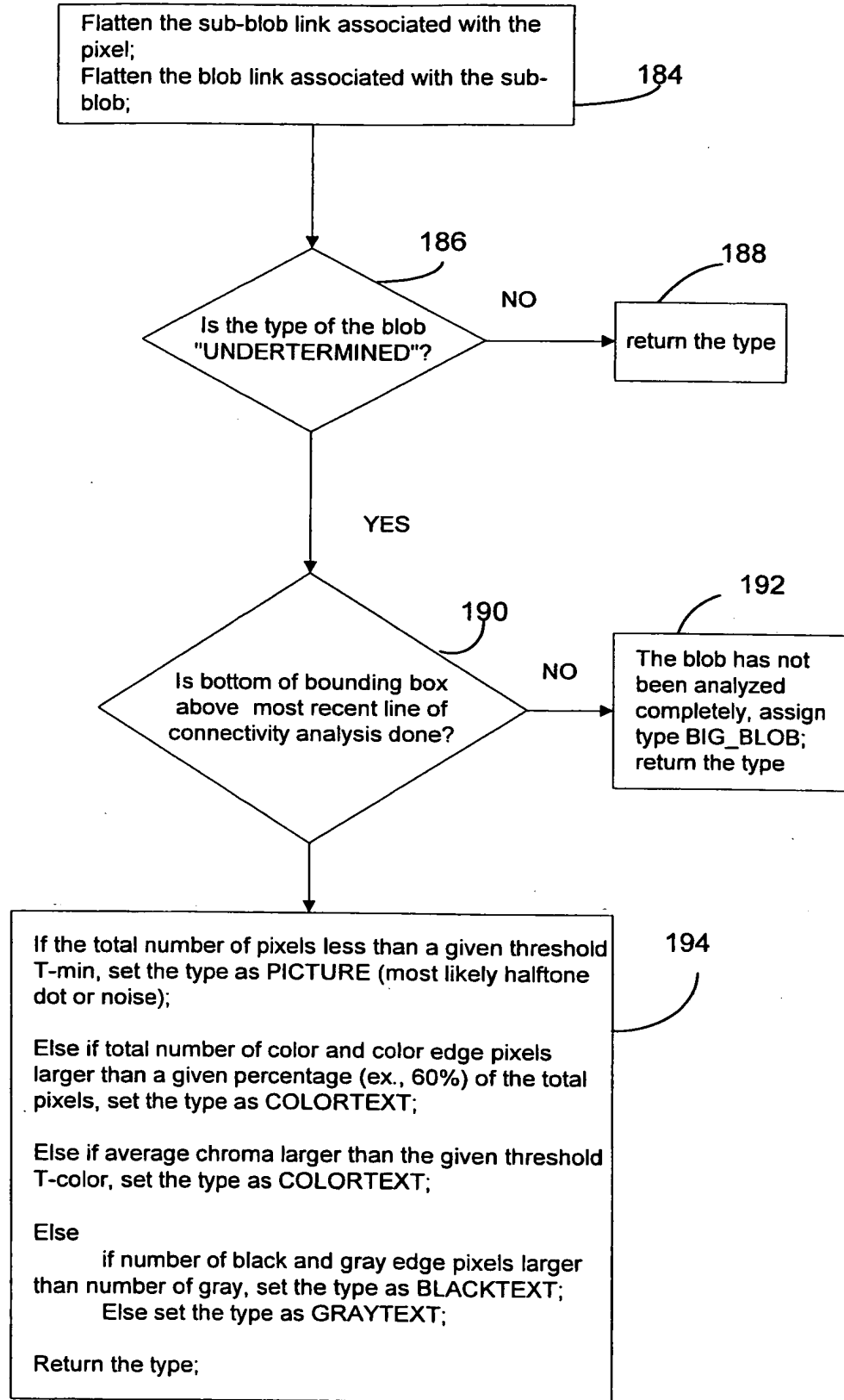


FIG. 14

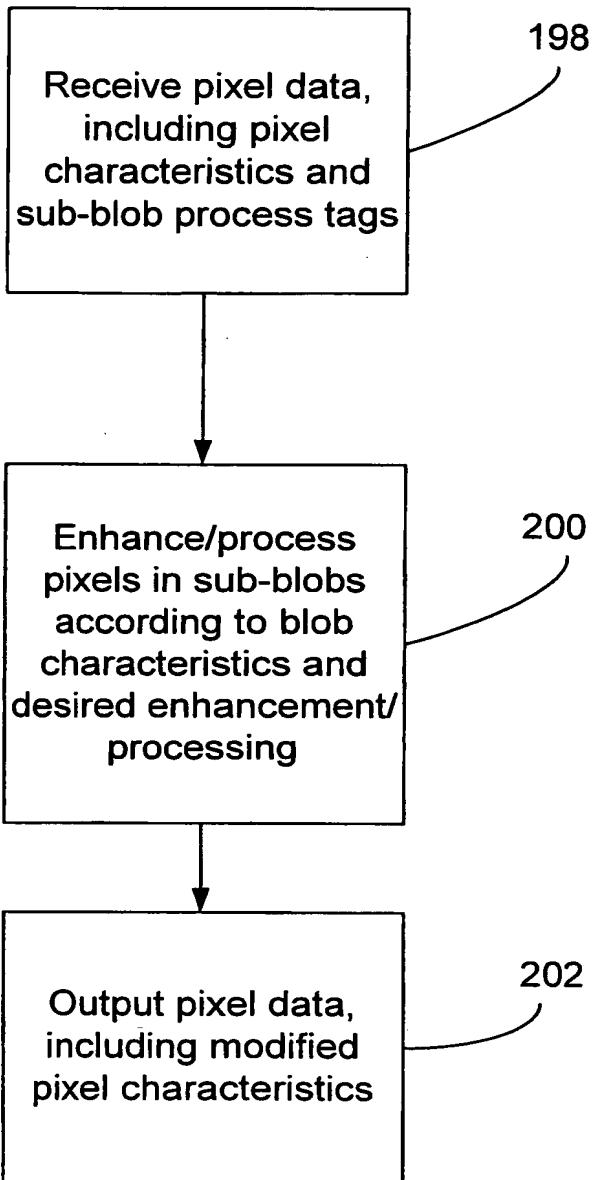


FIG. 15

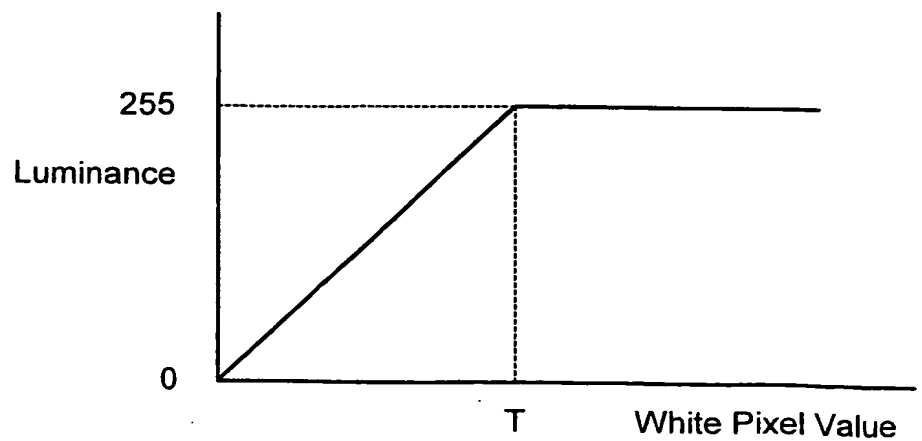


FIG. 16

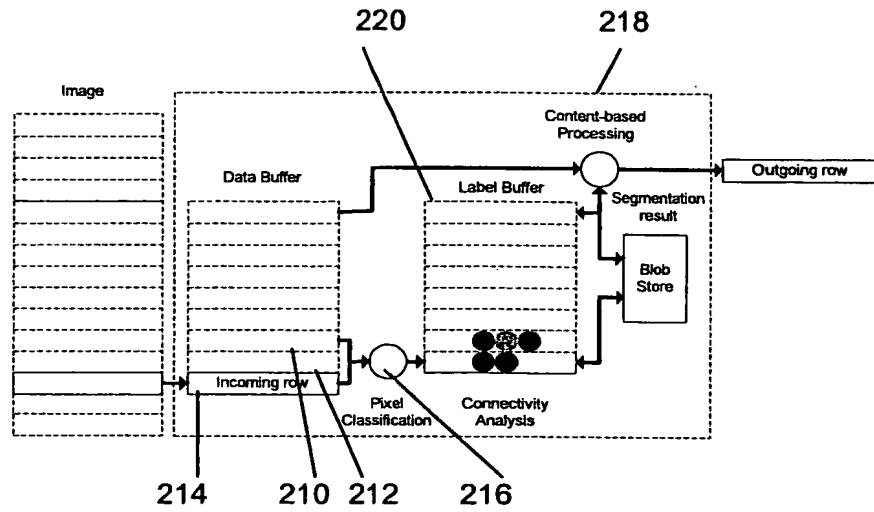


FIG. 17

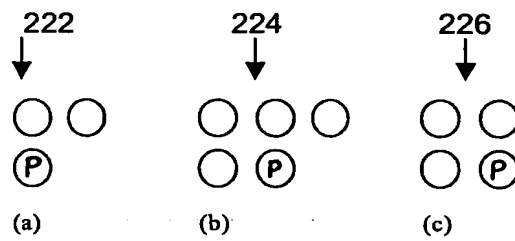


FIG. 18

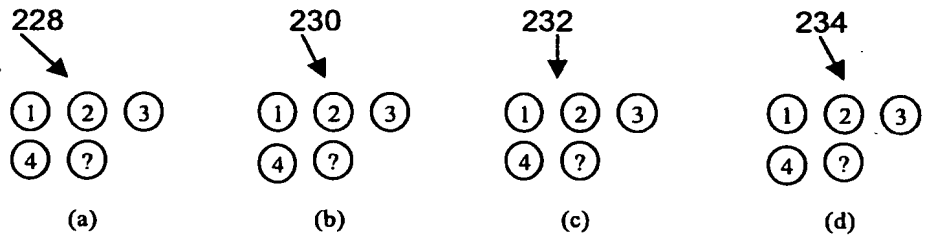


FIG. 20

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Box 1. Pseudo-code for the joint operation.

Joint (SubBlob *pSB1, SubBlob *pSB2)

1. Trace pSB1 to the root rtSB1;
2. Trace pSB2 to the root rtSB2;
3. Combine the two root nodes by adding attribute of rtSB2 to rtSB1 and in turn joining (works the same fashion as this one) two blobs if necessary;
4. Delete SBCore associated with rtSB2;
5. Link rtSB2 to rtSB1;

FIG. 21

Box 2. Pseudo-code for the flatten operation.

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Flatten (SubBlob *pSB)

1. Trace pSB to the root rtSB while short-cutting the nodes with only one reference count (for example in $A \Rightarrow B \Rightarrow C$, B is only pointed by A. In this case A can be pointed directly to C bypassing B)
2. Start from pSB again and point all link pointers directly to the root node rtSB

FIG. 19

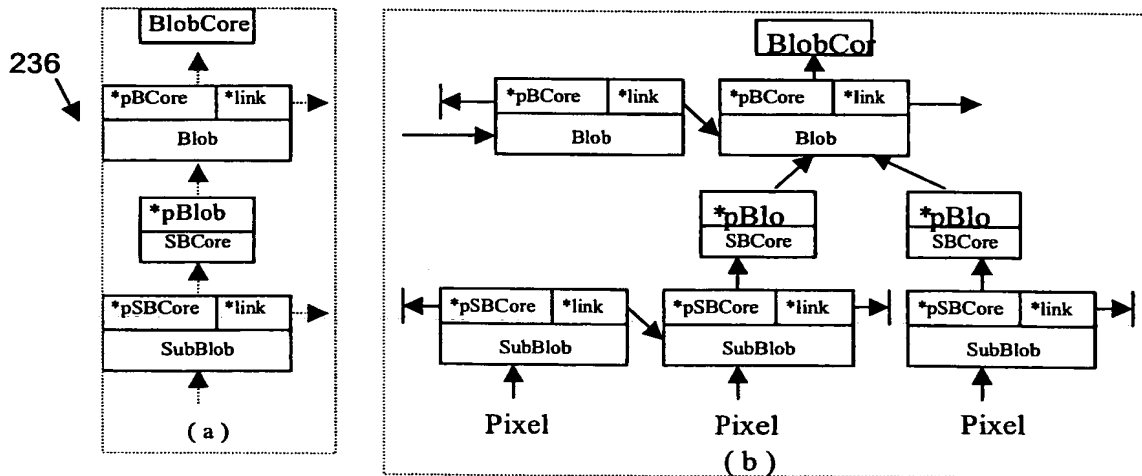


FIG. 22

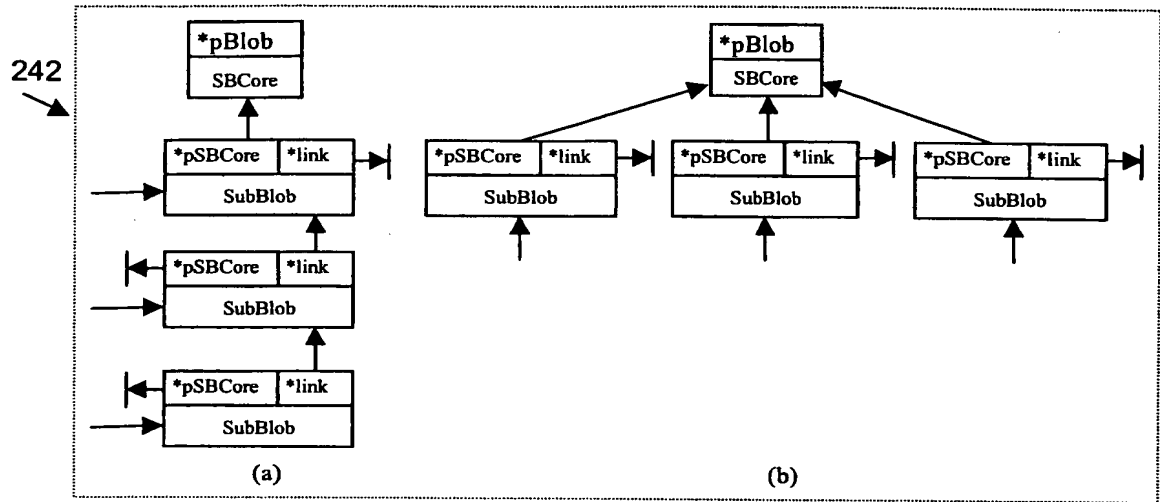


FIG. 23

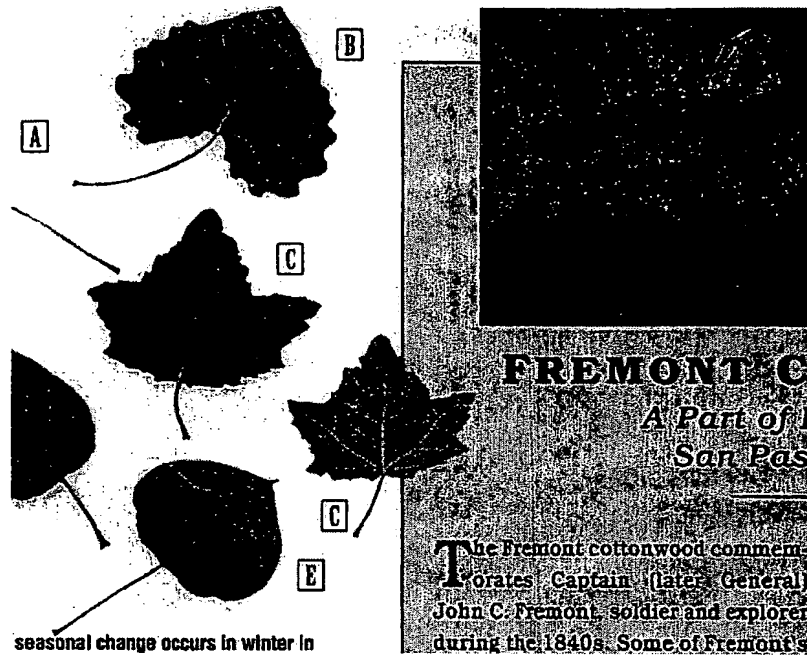
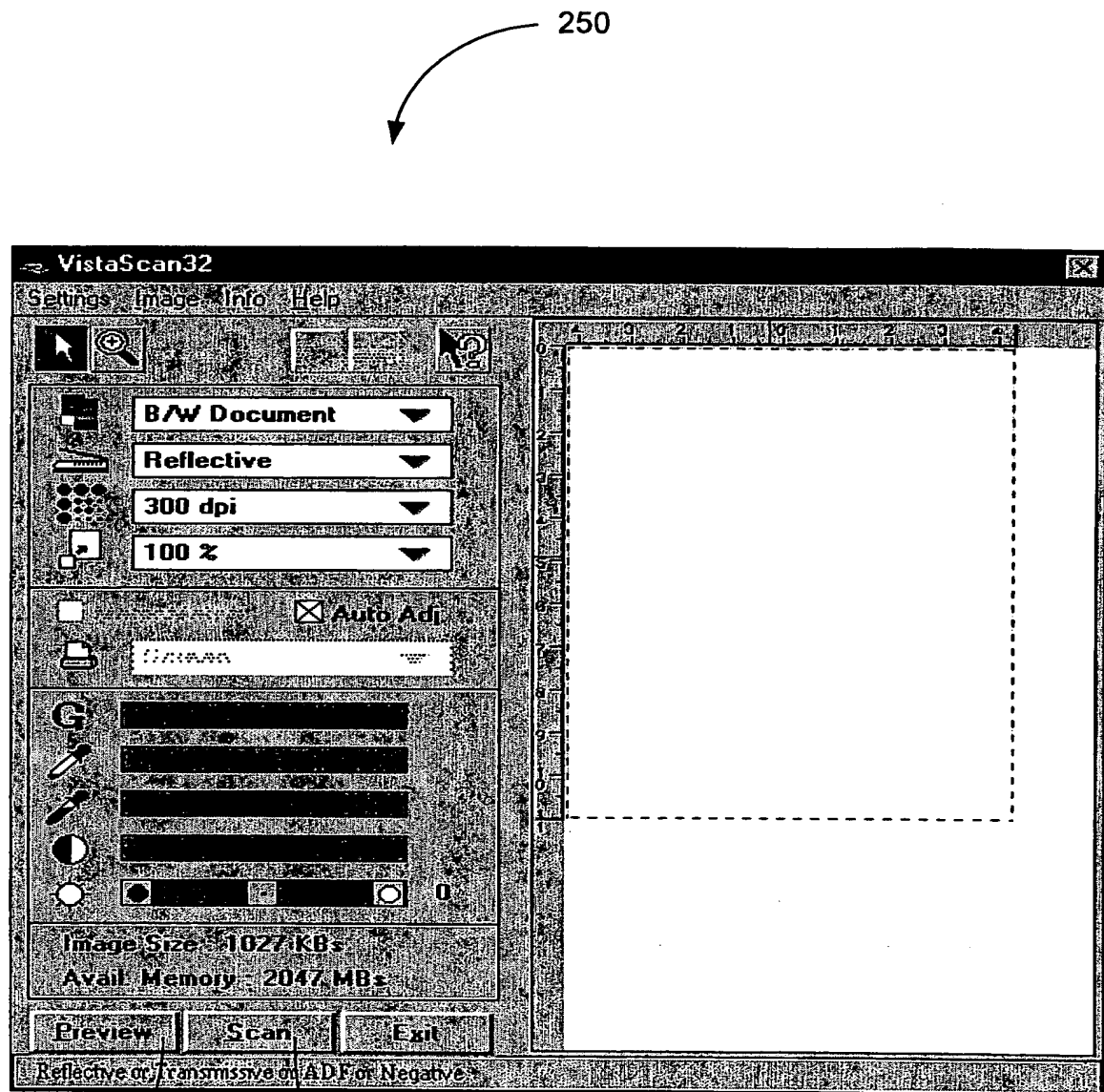


FIG. 24



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FIG. 25

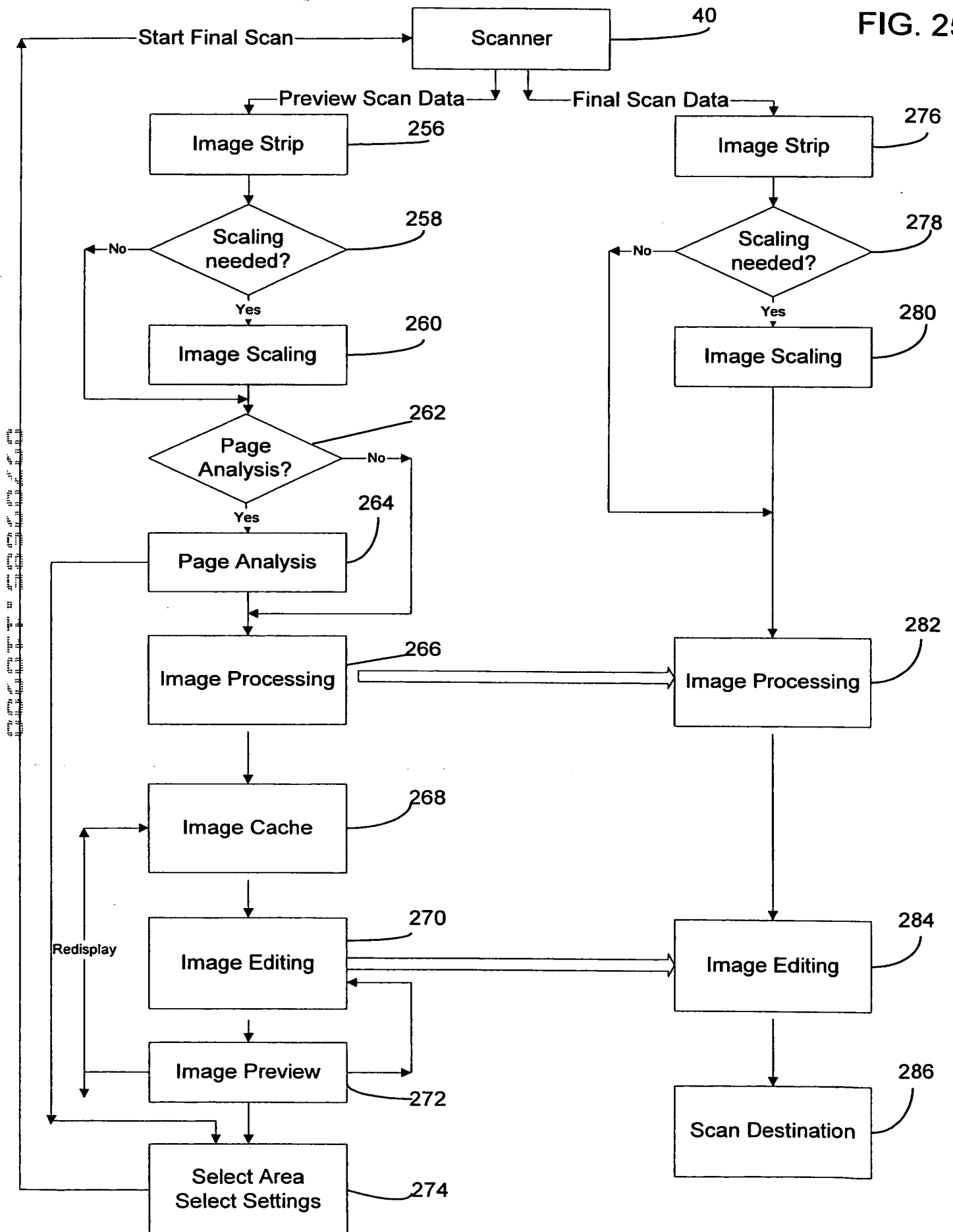


FIG. 26

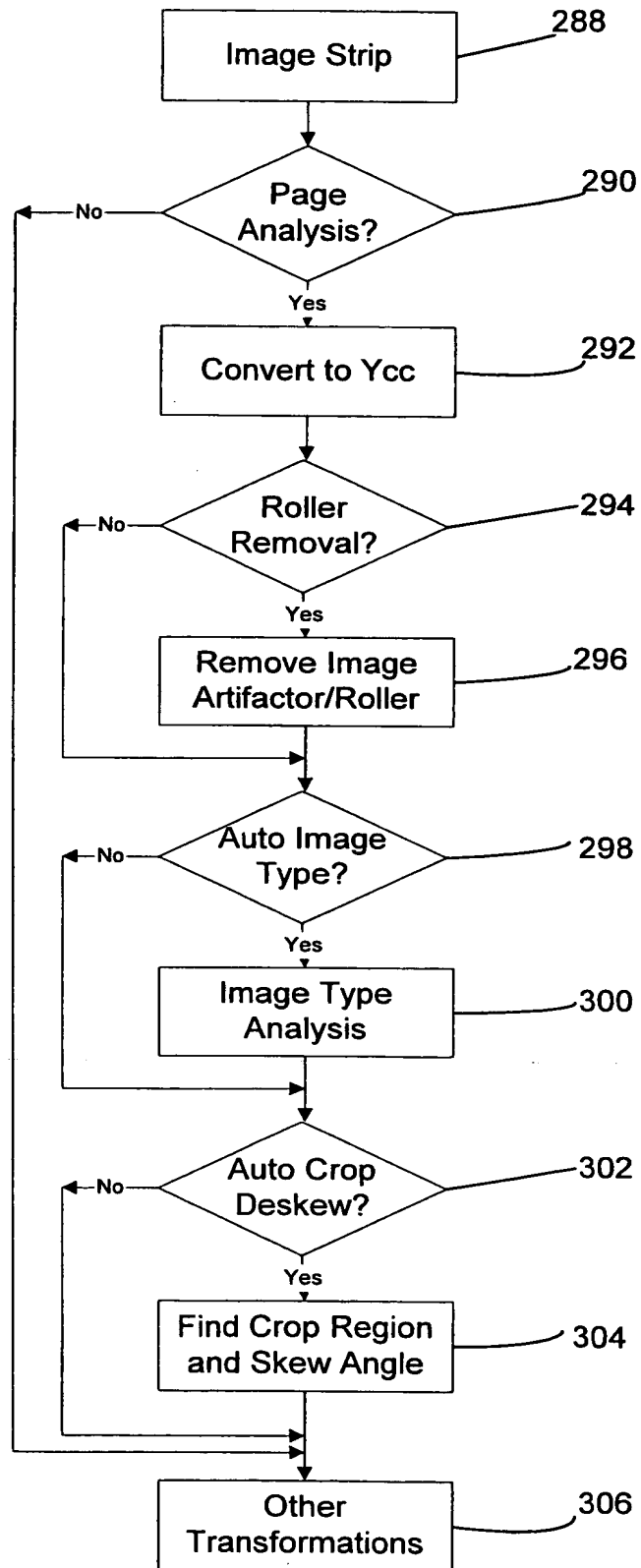


FIG. 28

FIG. 27

